AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of the claims in the application.

Listing of the Claims:

Claims 1-145 (Cancelled)

146. (New) A method for cleaning an object selected from the group consisting of metal parts, electronic components, electronic assemblies, adhesive-applying templates and printed circuit boards so as to remove at least one contaminant selected from lapping and polishing pastes, adhesives, solder pastes and fluxing agent residues, the method comprising:

preparing a liquid cleaning composition consisting of about 65%-99% by weight water and about 1-35% by weight of one or two glycol ethers, optionally including at least one additional organic compound selected from the group consisting of glycol, amino alcohol, furfuryl alcohol and tetrahydrofurfurylalcohol, wherein:

the glycol ether(s) has/have the formula:

$$R^1 - [X]_n - R^3$$

wherein: R^1 is one of n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl and tert-butyl,

X is $-OCH_2-CH(CH_3)-$,

n is 2 and

R^3 is –OH,

the glycol ether(s) and the optional organic compound(s), if included, form an azeotrope with water at the liquid-to-vapor phase transition point of the liquid cleaning composition and

the concentration of the glycol ether(s) is selected such that the liquid cleaning composition forms a two-phase solution at the cleaning temperature, in which the first phase primarily comprises the glycol ether(s) and the second phase is primarily water, which two-phase solution forms a glycol ether-in-water emulsion while at least one of agitation, intensive movement generated by pumping and ultrasound is applied to the two-phase solution at the cleaning temperature, and

contacting the object with the liquid cleaning composition at the cleaning temperature while the liquid cleaning composition is maintained in the state of being the emulsion, in which a plurality of glycol ether-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object, wherein both the glycol ether-rich droplets and the continuous aqueous phase contact the object and the at least one contaminant is effectively removed from the object by the liquid cleaning composition.

147. (New) A method as in claim 146, wherein at least one glycol ether is dipropropyleneglycolmono-n-propylether.

148. (New) A method as in claim 147, wherein the amino alcohol is selected from the group consisting of l-aminobutanol-2, monoisopropanolamine, 2-amino-2-methylpropanol-l, 2-amino-2-methylpropanediol-l,3 and ethanolamine.

149. (New) A method as in claim 148, wherein the one or two glycol ethers comprise between 3 and 25% by weight of the liquid cleaning composition.

150. (New) A method as in claim 146, further comprising:

after contacting the liquid cleaning composition with the object, supplying the liquid cleaning composition to a separating chamber,

allowing organic contaminants to precipitate out of the liquid cleaning composition in the separating chamber,

removing the precipitated organic contaminants from the liquid cleaning composition, and

re-using the liquid cleaning composition to clean another object.

151. (New) A method as in claim 146, wherein all components of the liquid cleaning composition are fully dissolved in each other at about 20-25°C.

152. (New) A method as in claim 146, wherein the cleaning temperature is between about 40-60°C.

153. (New) A method for cleaning an object selected from the group consisting of metal parts, electronic components, electronic assemblies, adhesive-applying templates and

printed circuit boards so as to remove at least one contaminant selected from lapping and polishing pastes, adhesives, solder pastes and fluxing agent residues, the method comprising:

preparing a liquid cleaning composition consisting essentially of 65%-99% by weight water and the rest being substantially a glycol ether component, wherein all components of the liquid cleaning composition are capable of forming an azeotrope at the liquid-vapor phase transition point of the liquid cleaning composition, the liquid cleaning composition does not have a flash point, and the glycol ether component is selected from the formula:

$$R^1 - [X]_n - R^3$$

wherein: R^1 is one of n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl and tert-butyl,

X is $-OCH_2-CH(CH_3)-$,

n is 2 and

R^3 is –OH,

contacting the object with the liquid cleaning composition at a cleaning temperature, wherein the concentration of the at least one glycol ether is greater than the solubility of the at least one glycol ether in water at the cleaning temperature, such that the liquid cleaning composition is a two-phase solution at the cleaning temperature, and wherein the liquid cleaning composition also has the property of forming a fully-miscible, one-phase liquid, such that all components are fully miscible or dissolved with each other, at a temperature that is lower than the cleaning temperature, and

maintaining the liquid cleaning composition in the state of an emulsion, in which a plurality of glycol ether-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object at the cleaning temperature, wherein both the glycol ether-rich droplets and the continuous aqueous phase contact the object and the at least one contaminant is highly effectively removed from the object by the liquid cleaning composition.

154. (New) A method as in claim 153, wherein the liquid cleaning composition is maintained in the state of a plurality of glycol ether-rich droplets suspended in a continuous aqueous phase by at least one of (i) agitating the liquid cleaning composition, (ii) intensive movement caused by pumping and (iii) applying ultrasound to the liquid cleaning composition.

155. (New) A method as in claim 153, wherein water comprises at least 75% by weight of the liquid cleaning composition.

156. (New) A method as in claim 153, wherein the liquid cleaning composition further comprises a relatively minor amount of at least one compound selected from the group consisting of glycol, amino alcohol, furfuryl alcohol and tetrahydrofurfurylalcohol.

157. (New) A method as in claim 156, wherein the amino alcohol is selected from the group consisting of l-aminobutanol-2, monoisopropanolamine, 2-amino-2-methylpropanol-l, 2-amino-2-methylpropanediol-l,3 and ethanolamine.

158. (New) A method as in claim 157, wherein the glycol ether component is between 3 and 25% by weight of the liquid cleaning composition.

159. (New) A method as in claim 153, further comprising:

after contacting the liquid cleaning composition with the object, supplying the liquid cleaning composition to a separating chamber,

allowing organic contaminants to precipitate out of the liquid cleaning composition in the separating chamber,

removing the precipitated organic contaminants from the liquid cleaning composition, and

re-using the liquid cleaning composition to clean another object.

160. (New) A method as in claim 153, wherein the liquid cleaning composition consists of water, dipropropyleneglycolmono-n-propylether and l-aminobutonol-2.

161. (New) A method as in claim 153, further comprising evaporating the liquid cleaning composition to remove the at least one contaminant therefrom, condensing vapor generated by evaporating the liquid cleaning composition and reutilizing the condensed liquid cleaning composition to clean objects.

162. (New) A method as in claim 153, wherein the at least one glycol ether is dipropropyleneglycolmono-n-propylether.

163. (New) A method as in claim 153, wherein all components of the liquid cleaning composition are fully dissolved in each other at about 20-25°C.

164. (New) A method for cleaning an object selected from the group consisting of metal parts, electronic components, electronic assemblies, adhesive-applying templates and printed circuit boards so as to remove at least one contaminant selected from lapping and polishing pastes, adhesives, solder pastes and fluxing agent residues, the method comprising:

providing a liquid cleaning composition consisting of 65%-99% by weight water, the rest being at least one glycol ether, at least one compound selected from the group consisting of 3-methoxy-3-methylbutanol, furfuryl alcohol, tetrahydrofurfurylalcohol, l-aminobutonol-2, monoisopropanolamine, 2-amino-2-methylpropanol-l, 2-amino-2-methylpropanediol-l,3, 3-(aminomethyl-)pyridine; ethanolamine and furfurylamine, and optionally further including at least one additional organic compound selected from amino alcohol and glycol, wherein the at least one glycol ether has the formula:

$$R^1 - [X]_n - R^3$$

wherein: R^1 is one of n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl and tert-butyl,

X is $-OCH_2-CH(CH_3)-$,

n is 2 and

R^3 is –OH,

contacting the object with the liquid cleaning composition at a cleaning temperature, wherein the concentration of the at least one glycol ether is greater than

the solubility of the at least one glycol ether in water at the cleaning temperature, such that the liquid cleaning composition is a two-phase solution at the cleaning temperature, and

applying at least one of agitation, intensive movement generated by pumping and ultrasound to the liquid cleaning composition, wherein the liquid cleaning composition forms an emulsion, in which a plurality of glycol ether-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object at the cleaning temperature, wherein both the glycol ether-rich droplets and the continuous aqueous phase contact the object and the at least one contaminant is effectively removed from the object by the liquid cleaning composition.

165. (New) A method as in claim 164, wherein the liquid cleaning composition includes tetrahydrofurfurylalcohol, a glycol and an amino alcohol.